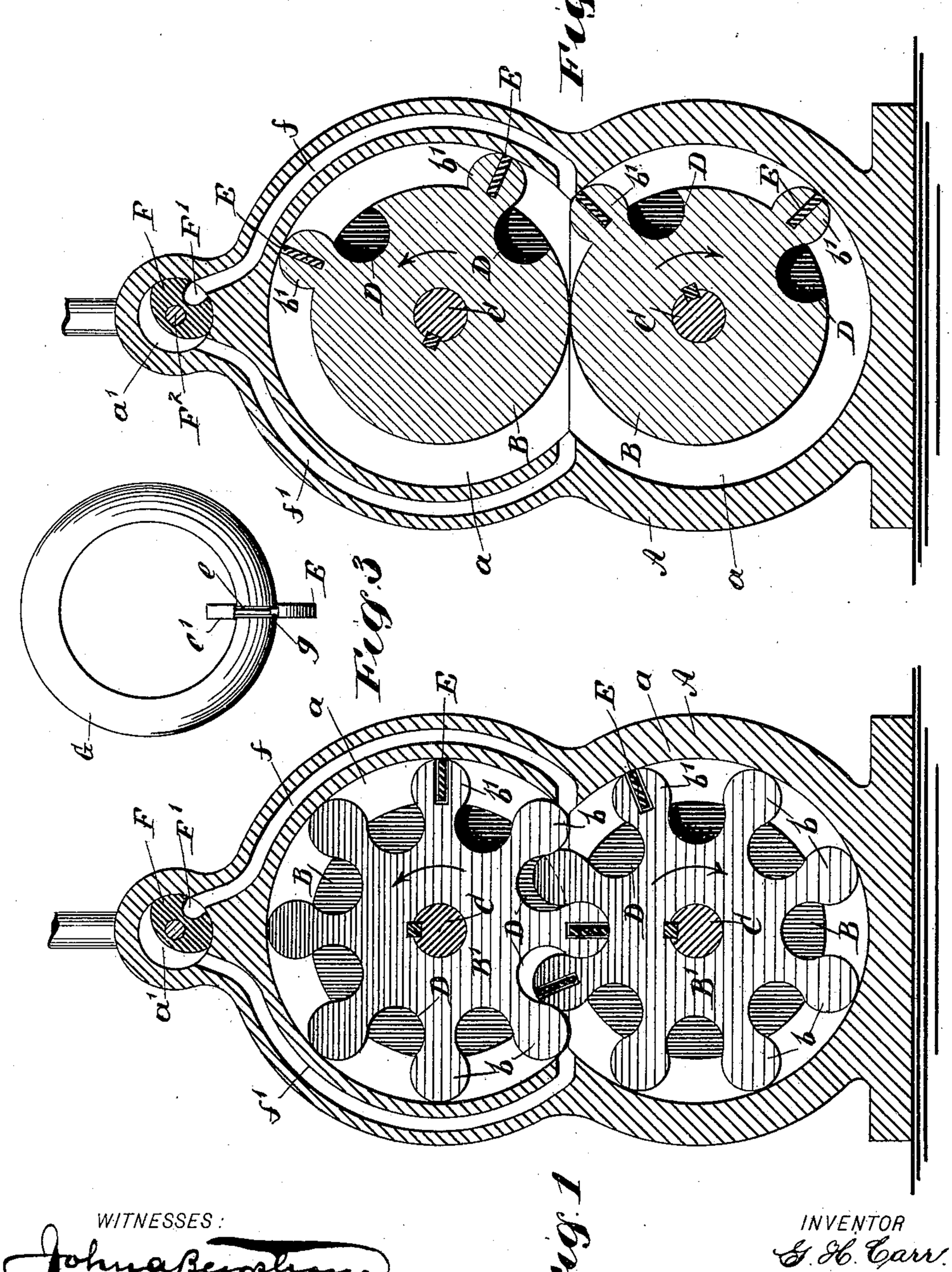
No. 618,393. Patented Jan. 31, 1899.

G. H. CARR.

ROTARY ENGINE.

(Application filed Feb. 10, 1898.)

(No Model.) 2 Sheets—Sheet 1.



WITNESSES:

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H. L. Reynolds.

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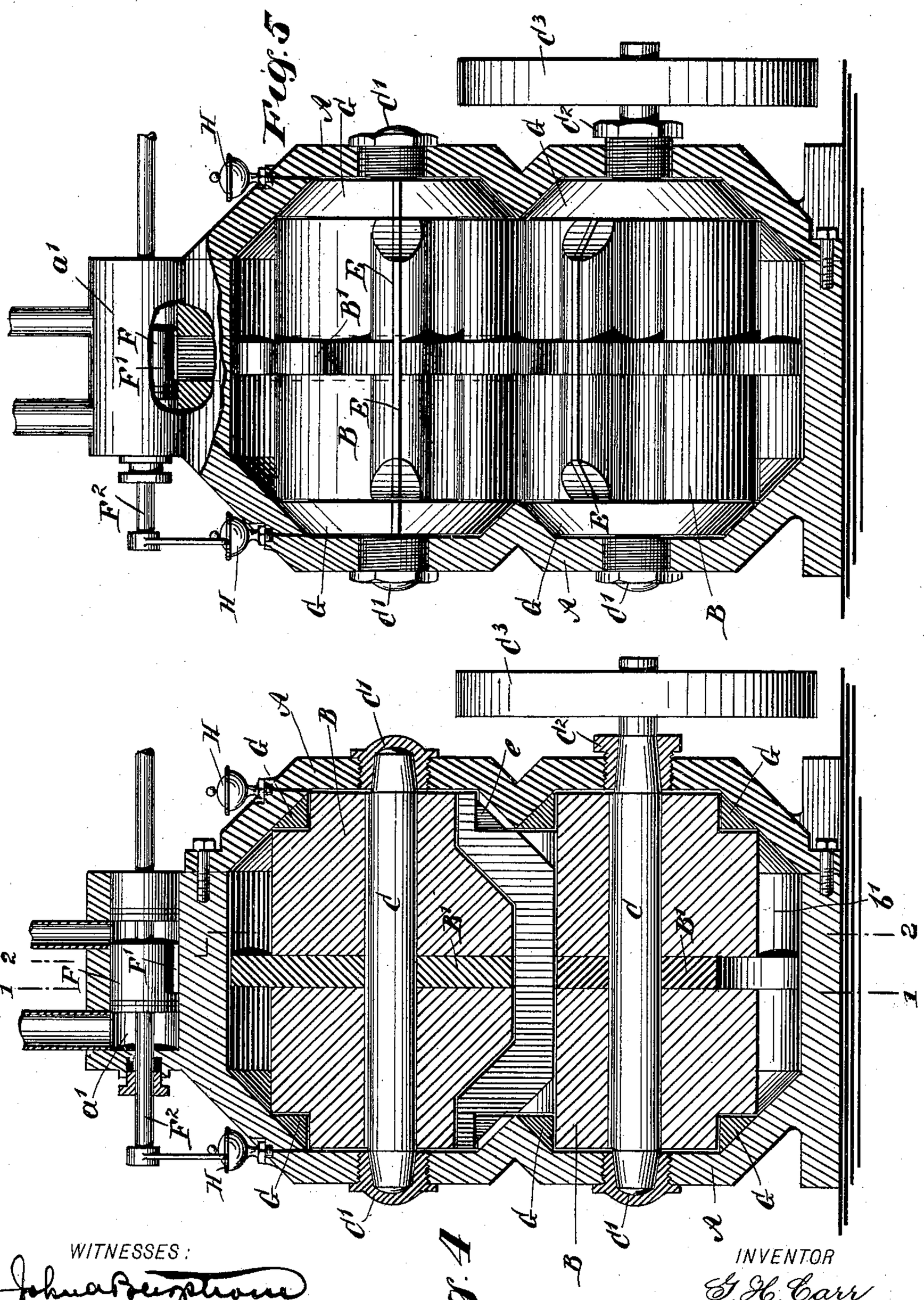

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UNITED STATES PATENT OFFICE.

GEORGE HENERY CARR, OF ROCKPORT, TEXAS, ASSIGNOR OF PART TO ISAAC N. FITZPATRICK AND REUBEN W. KELSEY, OF SAN ANTONIO, TEXAS.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 618,393, dated January 31, 1899.

Application filed February 10, 1898. Serial No. 669,808. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HENERY CARR, of Rockport, in the county of Aransas and State of Texas, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

My invention relates to an improvement in rotary engines; and it consists of certain features of construction, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a cross-sectional elevation through the cylinder and piston on the line 1 1 in Fig. 4. Fig. 2 is a sectional elevation on the line 2 2 in Fig. 4. Fig. 3 is an end elevation of the packing-rings located at one end of the rotating disks. Fig. 4 is a longitudinal sectional elevation taken through the two disks, and Fig. 5 is a side elevation with the casing in section.

My improved rotary engine comprises two rotating piston-disks having peripheral contact and connected to insure uniform rotation by means of a gear-toothed section preferably located at the middle of the length of the disks. These disks B B are preferably located one above the other and at such a distance apart that their surfaces are in contact. These disks are mounted upon shafts C, which are given suitable support in the surrounding casing A. This casing is provided with two cylindrical chambers *a*, surrounding each of the disks and at such a distance therefrom as to provide the desired steam-space. The disks are provided at the center of their length with a toothed section B′ and correspond in diameter with the pitch-circle of said gears or toothed sections.

The teeth *b* of one disk fit in the grooves or gorges D of the other disk, so as to form a steam-tight joint and also to insure uniform rotation of the two disks. This toothed section preferably is of but little longitudinal extent. Certain of these teeth, as the tooth *b*′, extend the entire length of the disk and are provided with a longitudinal slot centrally located therein and adapted to receive a packing-plate E. This packing-plate extends the entire length of the tooth and is adapted to be forced outward by centrifugal force and then to form a tight joint between the end of the tooth and the inner surface of the cylinder. The cylinders at each end are preferably formed with conical surfaces, and the disks and teeth *b*′ are also coned to fit these surfaces. The ends of the disks are also provided with a ledge adapted to receive the packing-ring G, said ring being of triangular cross-section and fitting within the notch thus formed in the end of the disk to insure a tight joint between said disk and the end of the casing. These rings G are cut at one side, forming an opening extending through the section of the ring.

The packing-plates, which are placed in the grooves in the teeth *b*′, are beveled at their outer ends to correspond with the outline of the cylinder, and they are provided with an inner section *e*, adapted to enter between the ends of the ring G at *g*, as clearly shown in Fig. 3. The shoulders formed by the reduced portion *e* of the packing-plate bear against the edges of the packing-ring G. The action of centrifugal force upon the packing-ring will be such as to cause it to expand, and thus to maintain a tight joint. As shown in the drawings, two of the teeth *b*′ are provided upon each cylinder, said teeth having the packing-plates E, as described. These teeth are the inner ones of the series, which extend throughout the length of the disks and form the pistons proper.

The casing A, forming the cylinders, is provided with steam passages or ports *f* and *f*′, the former being the supply-port and the latter the exhaust-port. This relationship may, however, be reversed by reversing the operation and position of the valve F, which controls the admission and exhaust. This valve is shown clearly in Fig. 4 and is provided with longitudinally-extending channels F′, communicating with opposite ends of the valve. The steam is admitted to one end of the chamber containing this valve and passes through the passage F′ to the steam-supply port *f*. The exhaust, passing through the other port *f*′, escapes to the opposite end of the valve

and is carried off through a suitable exhaust-pipe. This valve will not have any motion while the engine is in operation unless it is desired to work the engine expansively. In such case the valve will be operated by suitable mechanism to cut off the steam at any point desired. Where this is not done, the valve will not be shifted except when the direction of rotation of the engine is to be reversed. In such case it will be shifted so as to connect the passage F′ with the port *f′*.

The ends of the shafts C, which project beyond the disks B B′, are slightly coned, and the journals thus formed are supported in bearings similarly coned and formed in the inner parts of caps C′, said caps being screwed into the casing A, as shown in Fig. 4. One of these caps C^2 is made as a sleeve, the end of the shaft C projecting to the outer side and being provided with a band or fly wheel C^3. By screwing these caps into the casing the bearings may be adjusted.

This engine has no reciprocating parts of any sort. All the moving parts have rotary motion, and consequently the engine will run smoothly and without vibration or noise. The parts may also be made to fit accurately, so that there will be little friction and no leakage of steam. Two of the teeth *b′* being extended to form piston-heads and located at a sufficient distance apart, there will always be one of them in contact with the wall of the piston, so that the steam cannot blow around the disk. As the valve is set in Figs. 1 and 2 the steam will be admitted through the port *f* and be exhausted through the port *f′*, the rotation of the disks being in the direction indicated by the arrows. Oil-cups H are provided for lubricating the cylinders.

By reducing the length of the toothed section on the rotating disk as much as possible the disadvantages of said construction are largely obviated. It is a great deal more difficult to maintain a tight connection between the toothed sections of the two disks than between the smooth cylindrical sections. There is also more friction created by the rotation of toothed sections than by the rotation of plain cylindrical surfaces. To insure evenness of rotation, a toothed section is necessary; but in order to maintain a durable tight joint and to reduce the friction as much as possible this toothed section is made as short as possible. By this construction a tight joint and a reduction of friction are both secured.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A rotary engine, having two piston-disks held in peripheral contact, and provided with toothed sections comprising a portion only of the length of the disks and meshing with each other, a portion only of the teeth and coacting gorges extending throughout the length of the disks and forming piston heads or abutments, and an inclosing casing or cylinder provided with suitable steam-passages, substantially as described.

2. A rotary engine, comprising two disks held in peripheral contact, and having meshing toothed sections extending through a portion only of their length, a portion of the teeth and coacting gorges extending throughout the length of the disks, said teeth being longitudinally slotted and provided with a packing-plate in said slot, an inclosing casing or cylinder, the ends whereof have a coned section, packing-rings of triangular cross-section in said coned sections, said rings being cut on one side and one of the packing-plates projecting at its ends into the cuts in the rings, substantially as described.

3. A rotary engine, comprising two disks held in peripheral contact and having meshing toothed sections extending through a portion only of their length, a portion of the teeth and coacting gorges extending throughout the length of the disks, said teeth being longitudinally slotted and provided with a packing-plate in said slot, an inclosing casing or cylinder, the ends whereof have a coned section, packing-rings of triangular cross-section in said coned sections, said rings being cut on one side, and one of the packing-plates projecting at its ends into the cuts in the rings, that portion of the packing-plates between the ends of the rings being of reduced thickness and forming shoulders beneath and inside of the rings, substantially as described.

GEORGE HENERY CARR.

Witnesses:
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J. A. BRUNDOETT.